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ANNUAL FOREST INSECT REPORT, REGION 1, SEASON OF 1932

J.C. EVENDEN
COEUR D'ALENE, IDAHO
JANUARY 23, 1933

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ANNUAL FOREST INSECT STATUS REPORT
SEASON 1932.

To Officers in Charge of Organizations:

It is requested that this report be circularized through that portion of your organization interested in forest protection.

James C. Evenden, Entomologist.

Forest Insect Field Station,
Coeur d'Alene, Idaho,
January 23, 1933.

ANNUAL FOREST INSECT STATUS REPORT
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INTRODUCTION

The purpose of this report is to present not only a summary of the annual insect status reports submitted from the ranger districts of Region 1, but to include a brief resume of the entomological activity within the region during the past season. During the nine years that these ranger reports have been submitted, an excellent and valuable historical reference has been compiled at this station, which increases in value as data is accumulated. The character of the data submitted has improved with each year's reports, indicating a better understanding and appreciation of the seriousness of forest insect problems.

Though as a whole these reports satisfactorily depict existing conditions in many instances improvements can be made which will produce a more standardized result. The following comments refer to the different captions on the form used by the rangers in submitting their annual report:

1. Name of Area Affected. - The same local name for an infested area should be used each year. Variations in these names produce confusion in identifying the area in question.

2. Location. - Legal subdivisions as well as general locations should be given. A complete location of the area being reported upon is essential in identifying the area.

3. Number of Acres. - Refers to the total infested area and not the size of the spot actually examined. The acreage necessary to cover if control is instituted.

4. Extent of Attack. - Under this caption there should be given an idea of the intensity of the infestation - the number of red-tops or new attacks, for without such information a picture of the severity of the outbreak can not be drawn. Some field work will undoubtedly be necessary if this question is correctly answered.

5. Infested areas should be followed from year to year, or until such a time as the infestation is no longer of importance and should then be so reported. Areas have been reported with severe increasing outbreaks and the following season no mention made of the situation. Was the first report an erroneous one, or was the area overlooked the second season?

6. Each report should be confined to one insect. - Outbreaks of the mountain-pine beetle and Douglas-fir beetle are often included in the same report. It would be far better to list each insect on a separate sheet. Many rangers do this.

7. Remarks. - Nearly all reports were sadly in need of the personal reaction of the forest officer preparing them. After an officer has spent some time in the examination of an infested area a few remarks often prove to be of intense value.

In addition to the above items it is believed that there may be a tendency to minimize the importance of the few infested trees which are often encountered along trails and highways. The presence of such trees should be viewed with alarm, and a more thorough examination made in order to determine the actual status of the infestation. Through the lack of appreciation as to the importance of small groups of infested trees, serious outbreaks often develop - outbreaks which not only require large sums of money for suppression but are difficult to control.

These annual reports provide the only available source to which one may turn for a picture of existing conditions within the district. If they are to provide reliable information they must be based upon authentic data, and each ranger should be permitted to devote sufficient time to the examination of each infested area to fully satisfy himself as to existing conditions. To properly report upon an infestation some field work is necessary if the report is to be complete. Special training for these examinations is not necessary, but it is essential that the reporting officers realize the responsibility and seriousness of their task and take advantage of all available information which will tend to make the data secured more valuable.

SUMMARY OF RANGER REPORTS
1932

One hundred and fifty-four reports were received from 112 ranger districts. This is an increase of 3 reports and 4 ranger districts over the 1931 season. Of these reports, 12 were negative in character and 142 listed various insect infestations. Of the 142 insect infestations listed, 88 were considered as increasing, 29 as decreasing, and 25 as normal or stationary. There were 119 Dendroctonus outbreaks recorded, 11 spruce budworm, 5 true-fir beetle (Scolytus ventralis) and 7 infestations of spruce gall aphid, Ips, flathead borers, needle rusts, etc.

The following table shows the status of the different insects reported:

SUMMARY OF INSECT INFESTATIONS REPORTED

INSECT	YEAR	INCREASING	DECREASING	NORMAL	TOTAL
Mountain Pine Beetle	1932	64	20	12	96
D. monticolae Hopk.	1931	51	27	14	92
	1930	60	24	14	98
	1929	45	14	23	82
	1928	33	13	10	56
Western Pine Beetle	1932	2	2	0	4
D. brevicomis Lec.	1931	2	1	1	4
	1930	4	1	0	5
	1929	0	3	4	7
	1928	5	4	2	11
Douglas Fir Beetle	1932	13	1	5	19
D. pseudotsugae Hopk.	1931	2	5	1	8
	1930	4	2	4	10
	1929	2	1	2	5
	1928	5	4	2	11
Lodgepole Pine Beetle	1932	0	0	0	0
D. murrayanae Hopk.	1931	0	0	1	1
	1930	0	0	1	1
	1929	-	-	-	-
	1928	-	-	-	-
True-Fir Beetle	1932	5	0	0	5
Scolytus ventralis Lec.	1931	0	0	1	1
	1930	2	0	0	2
	1929	1	0	0	1
	1928	0	0	1	1
Spruce Budworm	1932	3	7	1	11
Cocoecia fumiferana Clem.	1931	1	7	1	9
	1930	6	5	6	17
	1929	4	9	3	16
	1928	11	12	4	27

From the preceding table it will be seen that there has been but a slight change in the general status of conditions with the exception of the Douglas Fir Beetle. The status of the reports of mountain-pine beetle infestations in white pine remains practically the same as in 1931. Since 1928, these reports have been as follows:

Year Reported	No. of Reported White Pine Infestations	Increasing Infestations	Decreasing or Normal Infestations
1932	25	10	15
1931	26	11	15
1930	42	22	20
1929	40	24	16
1928	27	18	9

The following table shows the number and status of ranger reports covering mountain-pine beetle infestations in white pine, submitted from the different forests in 1932.

MOUNTAIN-PINE BEETLE INFESTATIONS IN WHITE PINE

Forest	No. of Reports	No. reported in 1931	Increasing Infestation	Decreasing Infestation	Normal Infestation	Recommendations for Control
Blackfeet	2	2	-	2	-	No
Cabinet	0	2	-	-	-	No
Clearwater	3	4	3	-	-	No
Coeur d'Alene	4	3	2	2	-	Yes for 2 areas.
Flathead	2	1	1	1	-	No
Kaniksu	4	5	-	4	-	Yes for 1 area.
Kootenai	2	1	2	-	-	No
Pond Oreille	4	5	-	3	1	No
St. Joe	4	3	2	1	1	Yes for 3 areas.
	25	26	10	13	2	

The above table shows but a slight change in the status of the mountain-pine beetle infestation in white pine. Though more infestations were reported from the Coeur d'Alene and Kootenai Forests, conditions on these two areas are much better than in 1931, following control operations. Though one less report was received from the Clearwater, it is rather apparent that on the Cook Mountain area at least the infestations on this forest have materially increased since 1931.

The Supervisor of the Blackfoot reports a marked decrease in white pine infestations. On the Flathead the Supervisor is not alarmed at conditions, while on the Kaniksu all infestations were considered as decreasing though control was recommended for one area. The Pend Oreille reports four decreasing infestations, though not a great deal of data were submitted. There was an increase from 3 to 4 in the number of reports received from the St. Joe, and it would seem that a rather serious infestation may be pending in that forest.

There has been no abatement in the seriousness of the mountain-pine beetle infestation in the lodgepole-pine forests of the Region. As in 1931, reports of lodgepole-pine infestations were received from 18 of the 20 regional forests. In 1931 there were 43 increasing infestations reported from 15 forests while in 1932 there were 54 reports of such outbreaks received from 13 forests. The following tabulation shows the status of the reports received from the different forests:

MOUNTAIN-PINE BEETLE INFESTATIONS IN LODGEPOLE PINE

Forest	No. of 1932 Reports	No. Reported in 1931	Increasing Infestations	Decreasing Infestations	Normal Infestation	Recommendations for Control
Beaverhead	7	7	7	-	-	For 1 area
Bitterroot	6	13	4	2	-	No
Blackfeet	4	2	1	2	1	No
Cabinet	0	1	-	-	-	No
Clearwater	2	4	2	-	-	For 1 area
Coeur d'Alene	1	1	-	-	1	No
Custer	3	2	-	1	2	No
Deerlodge	6	5	6	-	-	No
Flathead	2	1	2	-	-	No
Gallatin	5	2	4	-	1	For 2 areas
Helena	7	4	4	2	1	No
Kootenai	2	3	2	-	-	No
Lewis & Clark	1	1	-	1	-	No
Lolo	10	10	9	1	-	No
Nezperce	5	3	5	-	-	No
Pend Oreille	0	3	-	-	-	—
Selway	4	3	4	-	-	No
St. Joe	4	1	4	-	-	Yes
	69	66	54	9	6	

There is little need to mention the seriousness of the situation, indicated by the above data, which exists throughout the lodgepole-pine stands of Regions 1 and 4. A rather intensive survey of the Beaverhead shows the presence of 16,300,000 trees attacked in 1932. The destruction of from 70 to 90 per cent of the lodgepole-pine stands of this forest is assured. In the Bitterroot the infestation has spread northward, infesting both lodgepole pine and yellow pine. In Idaho the Nezperce and Selway Forests present a serious situation. The

Supervisor of the Nezperce writes, "Mountain-pine beetles have just about completely devastated the lodgepole stands of the forest. Practically all trees above 6" d.b.h. have been attacked and the survival of trees above this class will be very small at the end of the next growing season." The Supervisor of the Selway states that he is of the opinion that practically all of the lodgepole over 4"-6" on the forest will be taken. It is apparent that this infestation has spread northward from the Salmon and other Idaho forests of Region 4, where very severe outbreaks exist. Though the destruction of the lodgepole forests of Idaho would seem to be assured, one can not foresee the future of this infestation in its relation to the white pine forests of northern Idaho.

Two independent outbreaks of the mountain-pine beetle in stands of limber pine were reported from the Absaroka Forest, and from the Beaverhead, Bitterroot, Clearwater, Deerlodge, Gallatin, Lolo, and Nezperce Forests outbreaks in both lodgepole pine and white-bark pine were listed, but recorded as lodgepole infestations.

Infestations of the western-pine beetle in ponderosa pine were recorded from the Cabinet, Custer, Lolo, and Nezperce Forests. On the Cabinet and Custer the outbreaks were decreasing, while on the Lolo and Nezperce an increase was recorded.

Nineteen outbreaks of the Douglas fir beetle were recorded from the Absaroka (1), Bitterroot (1), Blackfeet (5), Cabinet (2), Coeur d'Alene (1), Flathead (5), Kaniksu (1), Lolo (2), Nezperce (1) Forests. Increasing outbreaks of this insect were recorded from the Blackfeet(2), Cabinet (2), Coeur d'Alene (1), Flathead (4), and Lolo (1) Forests. There is a rather general outbreak of this insect throughout the Douglas-fir forests of the region, which has already resulted in heavy losses of Douglas fir. The future of these outbreaks can not be predicted.

Reports of spruce budworm outbreaks were again received from four forests as follows: Absaroka (2), Clearwater (1), Coeur d'Alene (1), Helena (2), Nezperce (1), Selway (4). Four of these outbreaks, Absaroka (1), Clearwater (1), Coeur d'Alene (1) and Helena (1), were considered as increasing. It would seem that there has been a marked decline in the severity of these outbreaks during the past season.

There is a widespread infestation of the true-fir beetle (Scolytus ventralis Lec.) throughout the fir forests of the Northwest. This infestation has increased materially during the past few years, and is now destroying large volumes of timber, which fortunately is of a low commercial grade. No outbreaks of the pine butterfly or Douglas-fir tussock moth were received.

Glacier National Park

Severe outbreaks of the mountain-pine beetle in white pine and lodgepole pine and of the Douglas-fir beetle in Douglas fir now cover practically the entire west side of the Glacier National Park. Heavy timber losses have occurred and more will follow. On the east side of the park outbreaks of the mountain-pine beetle have been recorded from practically all of the lodgepole stands.

Yellowstone National Park

Severe infestations of the mountain-pine beetle were recorded from all of the white-bark pine areas of the park. As yet these outbreaks have not spread into the lodgepole-pine stands adjacent.

1931 FIELD SEASON

Beaverhead National Forest

An extensive survey of the Beaverhead Forest was again conducted for the purpose of following the progress of the severe epidemic of the mountain-pine beetle which is sweeping over the lodgepole-pine stands of this area. The purpose of this study is to secure a better understanding of the spread and rate of increase that can be expected from infestations of this character. Since 1928, the losses of timber resulting from the insect epidemic on this forest have increased as follows:

Year	Number trees killed
1928	321,372
1929	2,084,123
1930	3,835,958
1931	12,238,732
1932	16,300,000

Though in 1932 considerable attention was devoted to such phases of this problem as the volume of timber remaining, susceptibility of certain timber types, etc., more work is necessary and the project will be continued next season with more attention being paid to such items.

Kootenai National Forest

Control measures were conducted on four white pine areas during the spring of 1932 against outbreaks of the mountain-pine beetle. During this project 1,794 trees were treated at a cost of $5800.00. A survey of this forest during the past season shows that though a satisfactory reduction in the infestation followed the control operations, further control will be necessary on two of the areas in the spring of 1933. An expenditure of some

$4000.00 should result in a thorough clean-up of the infestation on these areas.

Coeur d'Alene National Forest

Control measures were again instituted on the Coeur d'Alene Forest in the spring and fall of 1932, in combating mountain-pine beetle outbreaks in white pine. During the spring operation 7,906 trees were treated at a cost of $41,523.00, and in the fall 2,177 trees treated at a cost of $12,993.00. A survey during the late summer showed that though for the entire forest a marked reduction in the general infestation had not occurred, on many of the areas the infestation had been so reduced that further control was considered unnecessary. In addition to the 1932 fall project some $21,000 will be needed for the treatment of some 5,252 trees in the spring of 1933. It is expected that following the 1933 operation this project can be discontinued.

Glacier National Park

A small project was conducted on the east side of the Park against an infestation of the mountain-pine beetle in the lodgepole-pine stands of the St. Mary's River drainage. This project was instituted on a purely experimental basis with the idea of treating all infested trees within the area so that a decision could be made as to the possibility of insect flights from the severe west-side infestation where control was not considered as being feasible. This area was examined in September, and though newly infested trees were recorded it was believed that sufficient infested trees had been left untreated during the spring operation to have produced the 1932 attacks. An extensive survey was then made of all lodgepole-pine stands on the east side, and a rather general infestation recorded. If control measures are considered feasible, the sum of $10,000 will be required for the treatment of the 6,900 trees as indicated by the survey.

Yellowstone Park Project

Data secured from 1931 surveys, placed the future of this large project, which since 1929 had been directed towards the protection of the scenic Yellowstone forests, in such an uncertain light, and involved such large sums of money that control was discontinued for the 1932 season. The same areas, including the Park and adjacent forests, were surveyed in 1932 and these data though indicating that there had been no marked increases in the infestation did not offer sufficient justification to change the previous decision relative to further control. It is difficult to even attempt a prediction as to the future of the infestation in this territory. However, one may be sure that if the epidemic continues in its present severity, a very large per cent of the lodgepole-pine forests within these areas will be destroyed in a very few years.

Shoshone National Forest

In the fall of 1931 control measures were instituted within the Cody Canyon of the Shoshone National Forest in combating an outbreak of the Douglas-fir beetle. These insects were working in Douglas-fir stands that

had been weakened through defoliation by the spruce budworm during the past few years. A survey conducted in August, though covering 48 per cent more territory than the 1931 fall operation, showed that a reduction of 53 per cent had followed the treatment of 12,000 which cost but $0.76 per tree. Control was again conducted in the fall of 1932 and 8,158 trees were treated at the same low cost of $0.76. Following this operation it is expected that a large per cent of the area can be eliminated from future plans of control.

Region Four Projects

Control measures were again conducted against outbreaks of the mountain-pine beetle in the lodgepole-pine stands of the Cache, Ashley, and Wasatch National Forests. The following tabulation shows the number of trees treated and funds expended during the 1932 season:

	Spring 1932		Fall 1932	
Forest	Trees Treated	Total Cost	Trees Treated	Total Cost
Cache	5,251	$11,717	717	$1,169
Ashley	766	1,810	270	571
Wasatch	27,619	15,000	9,290	15,172

The extremely low cost as shown for the spring operation on the Wasatch is due to the very heavy concentrated infestation.

Teton National Park

Control measures were carried on against a very light mountain-pine beetle infestation within the lodgepole-pine stands of the Teton National Park. Data secured from a survey made later in the season indicate that no further work is necessary in lodgepole pine, though a rather severe infestation exists in some areas of white-bark pine.

SUMMARY OF ENTOMOLOGICAL INVESTIGATIONS

As in the past, practically the entire effort of the investigative force of the Coeur d'Alene station has been devoted to the study of destructive bark beetles. These studies have been directed towards the development of more effective and economical methods of control. Through the exhaustion and elimination of many suggested superficial leads as to new methods of control these investigations have revolved themselves into sound fundamental studies of basic principles. Such items as complexing phases of seasonal histories, host selection, flight and migration habits, parasites and predators, associations with other insects, thorough analyses of going control projects, etc., have all received careful attention during the past season. From such basic

studies a sound foundation is being built from which more effective and economical control methods are being developed.

During the past season confusing seasonal history phases of the mountain-pine beetle and Douglas-fir beetle have been carefully studied and clarified. The outstanding result of this study is the habit which parent adults have of emerging from the first tree attacked and subsequently attacking a second. This information emphasizes the potential danger of emerging broods, and provides a better understanding of late attacks, sources of reinfestation, as well as the so called abnormal increases which have occurred with some infestations. Caged experiments have been conducted and small experimental control projects started with the idea of contributing towards a better understanding of the problem of host selection. A study of the relation or occurrence of parasites to the different stages of overwintering bark beetle broods was conducted. With this information it is possible that even drastic changes may be made in our present methods of control. As there would seem to be a preponderance of these beneficial insects in trees attacked during June and which overwinter as new adults, it is possible that the treatment of this class of trees may be more injurious than beneficial. Further study is necessary before this factor can be accurately weighed.

An intensive study of spotting methods as practiced on the Coeur d'Alene brought a change in crew organization and materially increased its efficiency. The data from this project have been carefully analyzed in the hope that information will be forthcoming which will permit a more efficient and effective application of control measures.

In an attempt to learn more of the flight habits of bark beetles, "Glick" airplane traps were again used during a short series of flights over the Coeur d'Alene Forest. Though no bark beetles were taken during these flights, a number of different insects were collected at varying elevations. Weather-vane traps were also placed on a number of prominent lookout peaks, and some very fine collections, including bark beetles, secured. These traps will be continued during the 1933 season in the hopes that information will be received which will be of value in planning future projects.

Tree medication was again tested with both lodgepole-pine and white-pine trees infested by the mountain-pine beetle. Though very good success was secured from these additional tests, further work is necessary with the idea of improving the technique of application before the method can be economically used.

In order to protect trees of high scenic values from attacks of bark beetles, a series of tests were conducted with a number of different chemical sprays in an effort to render such trees immune. Though some promise of success was secured, none of the chemicals proved entirely satisfactory. This project will be continued, as the protection of highly-prized lodgepole-

pine trees around summer homes, resorts, etc., now constitute a very important economical problem of Idaho and Montana.

The annual survey of the Beaverhead Forest was again conducted in 1932. From this survey such information as the rate of spread, severity of destruction, per cent and character of stand remaining after the epidemic has passed, duration of outbreaks within an area, susceptibility of different age classes, timber types, exposures, etc., is being secured. This information is contributing towards a better understanding of the flights and spread of mountain-pine beetle epidemics in lodgepole pine which must be available if future projects are to be properly planned. This survey shows the following losses for the Beaverhead Forest:

Year	Number trees killed
1928	321,372
1929	2,084,123
1930	3,835,958
1931	12,238,732
1932	16,300,000

A study has been conducted of the Oregon engraver beetle (Ips oregoni), which periodically becomes a serious destroyer of pine reproduction and small trees. An understanding of the confusing seasonal history of this insect now permits control measures to be more accurately applied.

Studies of the factors contributing to the increase or decrease of insect epidemics have received some attention. Such phases as forest fires, logging slash, windthrows, etc., have been given all possible attention, though more time should be devoted to them.

CONTROL PLANS FOR THE 1933 SEASON

Realizing that the institution of these projects depends upon appropriations which as yet have not been made available, the following work has been recommended for the spring of 1933:

Coeur d'Alene National Forest	$20,000
Kootenai National Forest	4,000
Glacier National Park	?
Teton National Park	2,000
Yellowstone National Park	7,000
Shoshone National Forest	?

CONCLUSIONS

Available data would not indicate that any marked changes have occurred in the seriousness of the bark-beetle epidemics of this region. Though some reductions have occurred in white-pine infestations, lodgepole-pine outbreaks continue with increasing seriousness. Each year these infestations have spread to new areas and the annual loss steadily increases to tremendous figures. It is difficult to depict the actual scene of devastation left in the path of these lodgepole-pine epidemics. Mountain sides, thousands upon thousands of acres are literally red with the discolored foliage of the dying trees - trees which in a few years will fall to the forest floor, leaving an inpenetrable tangle of inflammable material which will last for decades, or until swept by apparently inevitable fires. The mature lodgepole forests of Idaho and Montana are doomed to destruction; destroyed by an epidemic of such a magnitude that thoughts of artificial control are impossible. In future plans of forest protection a repetition of such depredating insect outbreaks must be prevented. The solution of our forest insect problems lies in preventing epidemics rather than suppressing them. To achieve such results, outbreaks must be recognized and reported while in their incipiency. Field officers must carry the same sense of responsibility toward their insect problems as they do towards fire, trespass, etc. Through the neglect of the so-called harmless bug tree tremendous timber losses may occur.

It is gratifying to note the increased interest on the part of forest rangers toward their forest insect problems. The reports received, though certain suggestions have been made, show satisfactory improvement and progress, and present a very clear picture of existing forest insect conditions within the Region. It is trusted that all forest officers will continue to call upon the Coeur d'Alene station for information. The station desires to be of every possible assistance to all interested parties in helping them to better understand their insect problems.

Respectfully submitted,

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James C. Evenden, Entomologist.

Affirmed,

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Elers Koch, Chief of Management.